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AGRICULTURAL CHEMICAL RESEARCH DIVISION  
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A List of

PUBLICATIONS ISSUED IN 1945

Mimeographed and Journal Articles and Addresses (with Abstracts)  
and Patent

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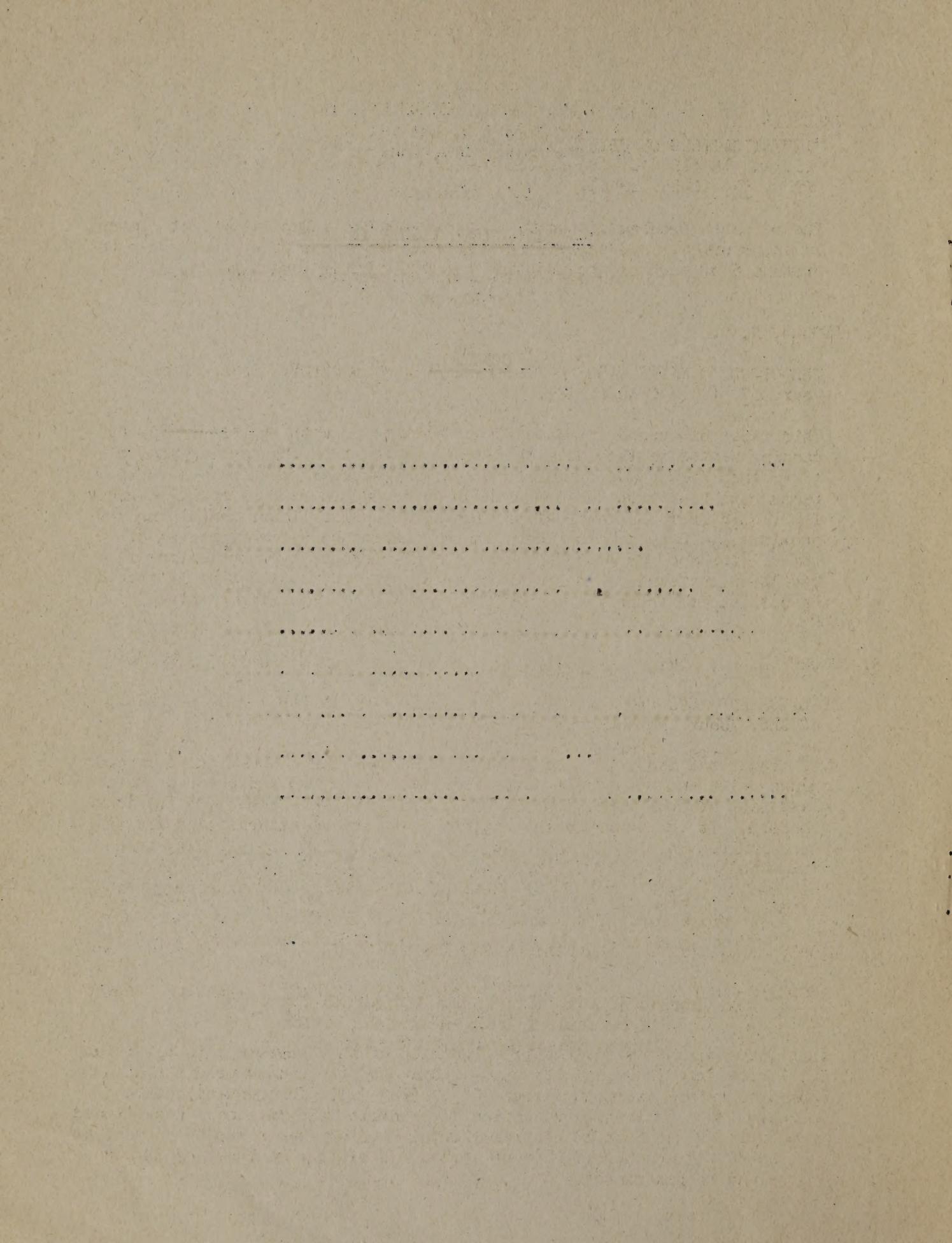
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NOTE: A limited number of reprints of some of the journal articles are available. Those not available are marked with an asterisk (\*), but may be consulted in technical libraries such as those located at State Agricultural Experiment Stations, Educational Institutions, and some public libraries.

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CITRUS

1. VELDHUIS, M. K.

\*INVESTIGATIONS ON CITRUS FRUIT PRODUCTS. Citrus Indus. 26, (1) 6, 7, 15, and 18 (1945). (Reprinted from Florida State Horticultural Soc. Proc. 57, 51-55, 1944).

The research program of the U. S. Citrus Products Laboratory, at Winter Haven, Florida, is described in a general way and a brief discussion is presented of each of the problems currently being investigated.

2. INGOLS, R. S.

THE CITRUS CANNING WASTE DISPOSAL PROBLEM IN FLORIDA. Sewage Works Jour. 17, (2) 320-30 (1945).

This paper discusses the question of what to do with the liquid citrus canning wastes in Florida. The liquid wastes from the canning plants are rather dilute and primarily a sanitary disposal problem. Descriptions have been given of the methods used and others that could be used. The liquid from the cattle-feed plants is a press liquor containing approximately 10 percent solids. The various methods for disposing of this liquor and for manufacturing several proposed byproducts from it have been reviewed. Results of pilot plant study showed that it should be possible to treat the concentrated wastes from juicing plants.

3. MOORE, E. L., Atkins, C. D. Wiederhold, Eunice, and MacDowell, L. G.

\*FLAVOR AND ASCORBIC ACID (VITAMIN C) RETENTION IN FRESH FLORIDA CITRUS JUICES. Jour. Home Econom. 37 (5) 290-293 (1945).

The flavor and ascorbic acid retention in hand-reamed and machine-reamed orange juice and grapefruit juice stored in uncovered and covered quart glass jars at room temperature ( $70^{\circ}$  F.) and in a cold room ( $40^{\circ}$  F.) is reported. It is concluded that ascorbic acid as it naturally occurs in citrus juices is stable, and that the length of time freshly extracted orange juice or grapefruit juice may be allowed to stand before use in the home is limited by loss of palatability and the beginning of fermentation and not by appreciable ascorbic acid losses.

4. MOORE, E. L., Wiederhold, Eunice, and Atkins, C. D.

ASCORBIC ACID RETENTION IN FLORIDA GRAPEFRUIT JUICES. II. During Storage of the Canned Products. The Canner 100 (8) 55-57 (1945).

This paper discusses an investigation made of the ascorbic acid retention in Florida grapefruit juices during storage of the canned products at a room temperature averaging about  $78^{\circ}$  F. ( $26^{\circ}$  C.). The results obtained indicate that the average retention of ascorbic acid in canned unsweetened grapefruit juices from 12 central Florida canning plants was 95 percent at the end of two months, 90 percent at the end of four months, and 83 percent at the end of six months.

5. ATKINS, C. D. Wiederhold, Eunice, and Moore, E. L.

VITAMIN C CONTENT OF PROCESSING RESIDUE FROM FLORIDA CITRUS FRUITS.  
Fruit Prod. Jour. and Amer. Food Mfr. 24 (9) 260-262, 281 (1945).

Four varieties of Florida oranges and two varieties of Florida grapefruit were analyzed to determine the content of vitamin C and its distribution in the fruit. About three-fourths of the vitamin C present was contained in the more solid parts of the fruit and about one-fourth in the juice. Preliminary experiments indicated that the peel and rag residues of citrus fruit tend to retain almost all of the vitamin C in this more solid part of the fruit, and these peel and rag residues may be considered a fine potential source of vitamin C.

6. WIEDERHOLD, Eunice, Atkins, C. D., and Moore, E. L.

ASCORBIC ACID RETENTION IN FLORIDA GRAPEFRUIT JUICES. III. As Related to Individual Factors of Canning Plant Operation. Canner 100 (23) 12-14, 23 (1945).

This paper deals with a survey made in March and April 1943 of the ascorbic acid (vitamin C) retention in Florida grapefruit juices during commercial canning. Effects of various types of equipment and processing conditions on vitamin C retention are listed.

7. VELDHUIS, M. K.

\*CITRUS FRUIT PRODUCTS RESEARCH. Proc. Fla. State Hort. Soc. 58: 51-55 (1945).

Progress during the year since the 1944 meeting, and projects being investigated at the U. S. Citrus Products Laboratory are discussed in a general way. (For previous report see reference under same title to Citrus Indus. 26, (1) 6,7,15 and 18, 1945).

8. MOORE, E. L., Atkins, C. D., Wiederhold, E., MacDowell, L. G., and Heid, J. L.

\*THE CONCENTRATING AND DRYING OF CITRUS JUICES. Proc. Inst. Food Technol. 160-168 (1945).

Commercial and scientific developments in evaporation, sublimation, and crystallization as applied to the concentrating and dehydration of citrus juices, with particular reference to orange juice, are reviewed. A type of orange juice concentrate designed for distribution in the frozen state is described.

9. WIEDERHOLD, E., Moore, E. L., and Atkins, C. D.

A NOTE ON OBSERVATIONS ON RETARDING DEVELOPMENT OF CHANGES IN FLAVOR AND COLOR OF GLASS-PACKED GRAPEFRUIT JUICE. Fruit Prod. Jour. and Amer. Food Mfr. 25 (4) 104-105 (1945).

Data is presented indicating that an initial period of storage at low temperature may have some beneficial effect on retention of color and flavor in glass-packed grapefruit juices after they are brought out and stored at ordinary temperatures.

10. JARRELL, T. D.

LIST OF PUBLICATIONS AND PATENTS ON CITRUS FRUITS AND PRODUCTS.  
AIC-96 (1945).

A complete bibliography of publications of the Bureau of Agricultural and Industrial Chemistry on citrus research from 1904 through 1945.

#### CONFECTIONERY

11. HALL, H. H.

REFERENCES ON CANDY MAKING AND SOURCES OF EQUIPMENT AND MATERIALS.  
Revised Nov., 1945. AIC-112.

A list of reference books on candy making, useful general reference books on food preservation, candy and related trade journals, and manufacturers and suppliers of equipment and materials for candy manufacture.

#### PICKLING AND BRINING

12. JONES, I. D., and Etchells, J. L.

\*FOOD VALUE OF BRINED VEGETABLES. Research and Farming, 4, Prog. Rpt. 1, 1-2; 12, (1945).

The use of vegetables which have been preserved in strong brines in a manner not requiring desalting will result in the greatest conservation of nutrient constituents. This can be accomplished through the use of the brined material in the preparation of soups or certain vegetable mixtures. When desalting is practiced, in the preparation of brined foods for table use, somewhat greater losses in protein and minerals may be encountered. Data is given on the retention of protein, minerals, and vitamins under different treatments.

13. ETCHELLS, J. L., Fabian, F. W., and Jones, I. D.

THE AEROBACTER FERMENTATION OF CUCUMBER PICKLES DURING SALTING.  
Mich. Agric. Expt. Sta. Tech. Bul. No. 200, (1945).

Results of a study of the typical fermentations brought about by the Aerobacter under salting conditions typical of the industry are reported. Data is given on evolution and composition of gases at different brine concentrations.

#### SUGAR BEETS

14. FORT, C. A., Byall, S. (I.) Hall, H. H., and Teunisson, Dorothea J. (II.)

REPORT OF STUDIES ON UNIFORMITY OF QUALITY OF BEET SUGARS. I. Chemical and Physical Studies on Beet Sugars of the 1944 Campaign. II. Biological Studies of Sugars. AIC-93 (1945).

An annual report of quality factors and quality ratings on composite beet sugar samples from sixty-five factories operating during the 1944 campaign. Data on four additional beet sugars are also included. In addition to the summary of operating data and chemical and physical determinations on the sugars, this report discusses the possible use of specific conductivities in determining the distribution between mineral and organic salts and adjusted specific conductivity-ash factors for individual factories. The usual microbiological tests are reported and, in addition, results of a study of the growth of molds in highly concentrated sugar solutions are given.

15. FORT, C. A., and Stout, Myron

WHITEWASHING SUGAR BEETS TO REDUCE SUGAR LOSSES IN STORAGE. Sugar 40 (9) 34-40, Sept., 1945.

Experiments have been conducted in which the sugar losses in lime-coated sugar-beet roots and in uncoated roots when stored under conditions comparable to those existing on the surfaces of storage piles have been contrasted. The effect of whitewashing storage piles in reducing sugar losses also has been determined. The low sugar loss in whitewashed sugar-beet roots apparently results from the reflection of the sun's rays by the whitened surfaces with consequent lower internal root temperatures and reduced respiration. The beneficial effect of whitewashing a pile of sugar beets is apparently largely limited to a surface layer about one foot in depth.

SUGARCANE

16. BALCH, R. T.

CLARIFICATION OF LOUISIANA CANE JUICES AND RELATED PROBLEMS.  
Sugar Bul. 24, (4) 28, Nov., 1945.

A general discussion of hitherto undetermined factors which affect the clarification process with recommendations of lines of investigation of most immediate importance to the industry.

SUGARCANE BYPRODUCTS - ACONITIC ACID

17. AMBLER, J. A., Turer, J., and Keenan, George L.

SOME SALTS OF ACONITIC ACID. J. Amer. Chem. Soc. 67, 1 (1945).

The insoluble aconitates which separate from sugarcane and songo sirups have been identified as calcium-magnesium aconitates having the optical-crystallographic properties of dicalcium magnesium aconitate hexahydrate, although they generally contain less than the theoretical proportion of magnesium. It is suggested that they are solid solutions of tricalcium aconitate hexahydrate with either trimagnesium aconitate or dicalcium magnesium aconitate hexahydrate. The preparation and properties of crystalline tricalcium aconitate hexahydrate, tricalcium aconitate trihydrate, calcium sodium aconitate dihydrate, dicalcium magnesium aconitate hexahydrate, magnesium acid aconitate tetrahydrate, and zinc acid aconitate tetrahydrate are described. Optical-crystallographic properties and indices of refraction are given for the above salts and for tricadmium aconitate hexahydrate and monopotassium aconitate.

18. BALCH, R. T., Broeg, C. B., and Ambler, J. A.

ACONITIC ACID IN SUGARCANE PRODUCTS. Sugar 40, (10) 32-35, Oct., 1945.

Quantitative data is given on the amount of aconitic acid in the juices of nine different sugarcane varieties grown in seven producing areas in Louisiana. Concentrations of the acid in sirups and molasses at different stages of processing are also reported. Some data are included on distribution of the acid in various parts of the stalks and tops of sugarcane. The variability in aconitic acid content indicates that certain areas of the state are potential sources of commercial yields of this byproduct while others are not. The idea of making several cuttings per year of green cane solely for production of aconitic acid is discussed.

19. BALCH, R. T.

\*REPORT ON ACONITIC ACID STUDIES AT THE HOUMA, LOUISIANA, STATION.  
Sugar Bul. 23 (22) 197-198 Aug. 15, 1945.

A report to the Contact Committee of the American Sugar Cane League in which the general conclusions with regard to distribution of aconitic acid in different varieties, producing areas, and sugarhouse products, is discussed. Consideration is also given to the possibility of growing cane solely for production of aconitic acid from several annual cuttings of immature cane which has a high content of the acid.

TUNG

20. MC KINNEY, R. S., and Oglesbee, R. E.

\*SOME VARIATIONS IN SOLVENT-EXTRACTED TUNG OILS RESULTING FROM THE SOLVENTS EMPLOYED. Proc. Amer. Tung Oil Ass'n 43-47, Aug. 1, 1945.

Studies of the extraction of tung oil with petroleum naphthas on laboratory and continuous pilot plant scales indicate that the source and type of naphtha fraction employed may have an effect upon the quality of the oil recovered. One heptane fraction yielded oil which was solid at room temperature, while heptane from another source yielded oil that was almost entirely liquid at ice-box temperature. Hexane fractions tested yield oils that were liquid at room temperature and solid in the cold. Varnish formulation tests with petroleum naphtha extracted tung oils have indicated that they yield excellent spar varnishes only slightly inferior to those prepared from expressed American tung oil. It appears to be possible to obtain a liquid tung oil of excellent quality by the use of a non-explosive chlorinated solvent; namely, trichlorethylene.

21. MC KINNEY, R. S., and Oglesbee, R. E.

\*PRELIMINARY STUDIES ON THE STORAGE OF TUNG FRUIT AND SEED. Proc. Amer. Tung Oil Ass'n 48-51, Aug. 1, 1945.

Storage studies on tung fruit during the summer and fall months have indicated that it may be possible to store tung fruit in cold storage without appreciable changes in the tung oil and protein. Notable changes have been found to occur in the oil and protein of tung fruit kept in normal storage during this period. These results have indicated that it may be possible to express the oil from tung fruit kept in cold storage at about 40° F. during the summer months; whereas, it has been found difficult, if not impossible, to do so with tung fruit kept in normal storage into summer months.

22. MC KINNEY, R. S., Pack, F. C., and Oglesbee, R. E.

\*DRYING OF HULLED TUNG FRUIT. Proc. Amer. Tung Oil Ass'n 52-54, Aug. 1, 1945.

Observations are recorded on the performance of two commercial types of driers in drying tung nuts which had been dehulled by a field huller. The importance of low or moderate temperatures in drying such material is pointed out and the effect of various drying conditions on extractability and quality of oil is discussed.

23. O'CONNOR, R. T., Heinzelman, D. C., Freeman, A. F., and Pack, F. C.

THE SPECTROPHOTOMETRIC DETERMINATION OF ALPHA-ELEOSTEARIC ACID IN FRESHLY EXTRACTED TUNG OIL. Anal. Ed., Indus. and Eng. Chem. 17 467-470 (1945).

The procedure for estimating alpha-oleostearic acid in freshly extracted tung oil by direct spectrophotometric measurements is described and extinction coefficients for the pure acid in oil solvents are reported. The extinction coefficients in hydrocarbon solvents have been used to determine the alpha-oleostearic acid content of some tung oil samples. The spectrophotometric procedure used is more direct, much simpler, and considerably more rapid than chemical methods.

#### MISCELLANEOUS AND GENERAL

24. PENTZER, D. J.

\*DEHYDRATION OF TEXAS GROWN SNAP BEANS. The Fruit Prod. Jour. and Amer. Food Mfr. 24 (5) 136, 137, 157 (1945).

This paper discusses a required blanch of ten minutes in flowing steam before dehydrating 4-sieve snap beans to produce a product that was tender after subsequent rehydration. This blanch was longer than required to merely inactivate the enzymes. Dipping the blanched beans in a solution of sodium bicarbonate before dehydration did not improve the color of the reconstituted dehydrated beans but it did have a tenderizing effect.

#### PATENT

\*Hard Waxes and Fatty Products Derived from Crude Sugar Cane Waxes. Royal T. Balch. U. S. Patent 2,381,420 (August 7, 1945).

NOTE: Patents may be purchased for 25¢ each at the U. S. Patent Office, Department of Commerce, Washington 25, D. C. Stamps are not accepted and coins are sent at the sender's risk.

18. FEBRUARY